# THE TRINOPTRIC LANTERN OF THE REV. BEECHEY

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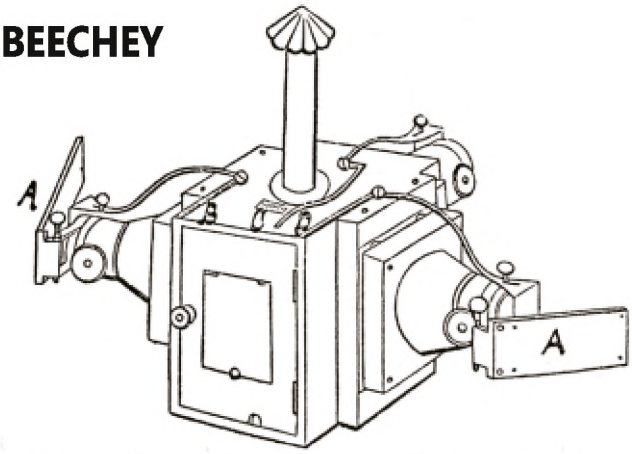
In December 1896 a reader of *The Optical Magic Lantern Journal and Photographic Enlarger* (*OMLJ*) wrote to the publication responding to their November article which asked if dissolving effects could be produced with a single lantern. The correspondent, a clergyman named J. J. S. Bird, recalled the 1893 appearance at his Parish Rooms of a travelling lanternist who produced "some of the most beautiful dissolving effects" that he had ever seen using a single lantern.[1] Bird attempted to buy the lantern for £20 but was told it was not for sale and was likely the only one of its kind still surviving. The next month, January 1897, another correspondent, Herbert Newman, identified the lantern discussed by the Rev. Bird as one invented by the Rev. Canon Beechey and used by him in a recent lantern lecture that Newman had seen.[2] By August, the editors at *OMLJ* had tracked down a description of the Beechey Trinoptric Lantern and a date for its appearance "somewhere about the year 1846 or 1847", while providing an illustration of the lantern and a brief description of its operation.[3] The next month the illustration was repeated in a second article from one of the *OMLJ*'s readers who used mathematical calculations to take a critical perspective on the images produced by the lantern's three lenses attached to a single illuminant,[4] while in the following month, October 1897, the *OMLJ* had extensive remarks on the lantern in an article signed by Canon St Vincent Beechey himself, "hale and hearty" at the age of 91, that included a photograph of his recently improved new model of the Trinoptric Lantern.[5]

All of this information from *OMLJ* was condensed and clarified by David Robinson for his entry on the Trinoptric Lantern in the Society's *Encyclopaedia of the Magic Lantern*, discussed in an entry under the name of its inventor, Canon St Vincent Beechey (see Fig. 1).[6] As a lantern collector and a film critic who wrote the definitive biography of Charlie Chaplin,[7] Robinson has a special interest in multi-lens lanterns and the effects that they could produce, writing for the Society about the first biunial lantern[8] and also a history of triunials.[9] In *Servants of Light*,[10] Robinson stated that "triple and triunial lanterns are undoubtedly rare," as he traced the manufacture of triunial lanterns from 1874 to 1907, noting early suggestions for patents of two or more sets of burners and lenses in 1872. Beechey's Trinoptric Lantern pre-dates all of these instruments by nearly 30 years, and it would seem that his triple lantern was the rarest of them all.

Thanks to the vastly expanded *British Newspaper Archive* database, it is now known that the Trinoptric Lantern was used extensively in the English Midlands, supporting a minimum of 58 known presentations by at least four lecturers between February 1847 and November 1868. Many more shows were undoubtedly given than those that were reported in contemporary newspapers, as even the known ones were often at small local bazaars or in schoolroom lectures. Today, it is not possible to calculate how often or how frequently the Trinoptric Lantern was in use in those years. By far its most frequent known exhibitor was the lantern's inventor, the Rev. St Vincent Beechey, but the lantern was also used in support of multiple lectures by W.H. Gratton on musical topics and W.D. Hall for his lectures on Egypt, Palestine and the Holy Land; Beechey himself operated the lantern for lectures given by a Mr Turner on anatomy and physiology. Beechey assigned the exclusive rights to manufacture his lantern to the scientific instrument maker Abraham Abraham of Liverpool, and it was Abraham who entered the Trinoptric Lantern as an exhibit at the Great Exhibition of the Works of Industry of All Nations held in the Crystal Palace in Hyde Park, London, in 1851.[11] Abraham had already been selling the Beechey lantern for some time, since it was he who registered the copyright of its design on

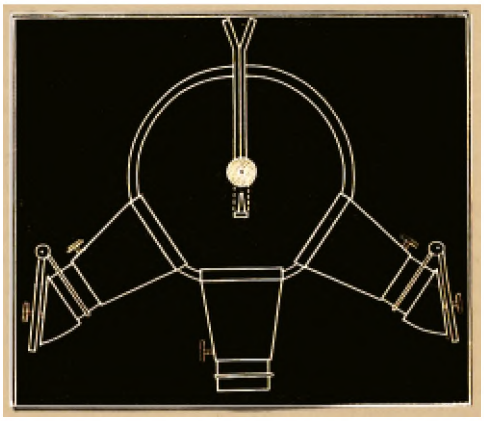



*1. The early form of Beechey's Trinoptric Lantern, c.1848, as shown in* OMLJ *and illustrated in the MLS* Encyclopaedia of the Magic Lantern

9 February 1848.[12] Abraham's registration quickly became known publicly as the 'new patent' Trinoptric Lantern,[13] a label that stuck to the lantern for all its life: the anonymous showman in *OMLJ* in December 1896 still reported "the lantern had been a patent, but owing to the enormous cost, about £50, it had years before been forgotten."

The early 1840s saw the introduction of dissolving views to magic lantern culture, associated with the Royal Polytechnic Institution in London and the lantern skills of Edmund H. Wilkie. As the most exciting new lantern technique spread across the country, dissolving views in the Trinoptric Lantern were consistently praised in contemporary news reports, eroding criticism from the *OMLJ* fifty years later as well as that of Robinson in 2001. The new lantern, reported a Manchester newspaper in 1848, "drew the attention of several persons conversant with such a mechanism, who, after the lectures, asked leave to inspect it. They expressed great admiration of its ingenious, but simple machinery; and everybody was struck with the precision and efficiency with which it delivered and dissolved on screen, the beautiful pictures successively introduced."[14] At the second lecture for a meeting of the Lancaster Athanæum the next year, it was reported that "The dissolving views can hardly be excelled, and the power of the instrument was strongly shown in the production of a double picture 30 ft by 15 ft."[15] The Trinoptric Lantern seemed to work equally well for lecturers other than the Rev. Beechey, as seen in the report of a lecture at the Lytham Bazaar by W.H. Grattan a few months later, where "every one present appeared highly delighted with the beautiful scenes represented by that interesting process termed 'dissolving views.' To particularize would be difficult, where all were so beautiful, but we were especially pleased with Tiberias and the Sea of Galilee, Antioch in Syria, and the interior of the Church of the Holy Sepulchre at Jerusalem."[16] Reports of the quality of the dissolving views projected by the lantern Beechey invented never wavered in highly consistent press notices, and as the years passed into the 1850s we can only assume that audiences (and journalists) became more and more familiar with the very popular dissolving views, which continued nonetheless to be singled out in notices of Beechey's lantern. A lecture in Burnley was "splendidly illustrated," one in Cheadle had illustrations "very attractive and interesting," another at Bourn claimed "dissolving views, scenery, &c., exhibited by his powerful trinoptic [*sic*] apparatus were first rate," and by 1855 a Manchester lecture "was accompanied with a variety of illustrations given by the aid of a much admired Trinoptic [*sic*] lantern, and was warmly applauded by a large and highly respectable audience."[17]

The very positive reports of both dissolving views and panoramic effects in the Rev. Beechey's lantern were due in no small part to his use of the Bude light as the illumination in the apparatus, a lamp mentioned in several contemporary reports of lectures.[18] According to William Chadwick, an author and lantern dealer working in Manchester where



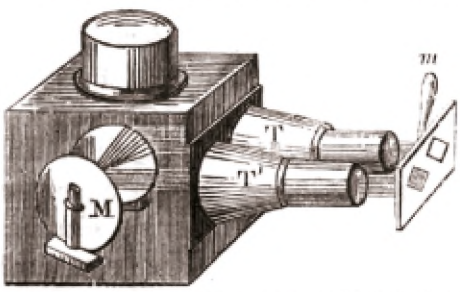
*2. The evolved form of the Trinoptric Lantern, sketchily, also illustrating the spherical lime of its Bude light, c.1850, from William Chadwick's* The Magic Lantern Manual, *p.74*

he would have had the opportunity to closely examine Beechey's local invention, the Trinoptric Lantern initially was equipped with an "oxy-hydrogen lime light, the cylinder form of lime being used, and which was supported upon a pin, this pin being fixed central with all three condensers. An unequal light was the result, the side systems receiving less than the centre one."[19] Beechey quickly recognised this defect in the illumination of his lantern, and by early 1851 had changed his illumination to the Bude light. Patented on 8 June 1839 by Goldsworthy Gurney, who had discovered limelight in the 1820s, the Bude light used a tube delivering pure oxygen into the centre of the circular wick of an Argand burner, which produced an intense, white light twice as powerful as an Argand lamp while using one-quarter of the oil. The light used a spherical lime suspended over the wick by a thin platinum wire, so that the lower half of the sphere radiated a bright light equally to all three condensers. Chadwick gives a clear description of Beechey's improved illuminant without using its name, reporting that Beechey "discarded the cylinder form of lime and substituted the spherical, which was suspended by a platinum wire over the flame of a fountain oil lamp, through the centre of which passed a gentle stream of oxygen. The whole of the lower portion of the lime was thus rendered incandescent, and the rays of light collected by each system thus equalized."[20] The illuminant of the Trinoptric Lantern through the Bude light was still described in *OMLJ* two decades later in August 1897 as "a fountain lamp with a circular wick" supplied with oxygen through a tube at the centre of the wick which then heated a ball of lime suspended by a fine wire over the wick and the oxygen tube, an arrangement "which greatly increased the brilliancy of the light. The best olive oil was used in the lamp, and the consumption per hour was an ounce and a half of oil and about a cubic foot of oxygen."[21]

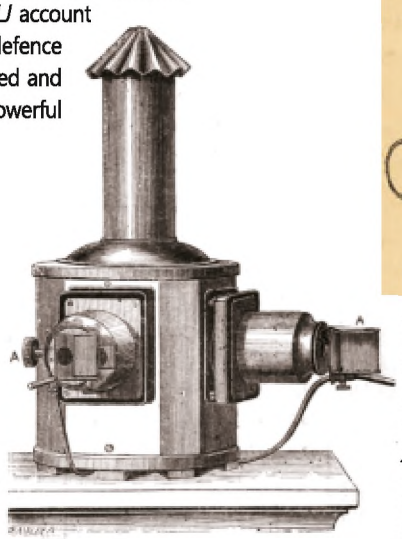
Extra-strong illumination in the Beechey lantern would certainly have helped exhibit dissolving views and other multiple-slide effects, and might possibly also have defrayed the criticism of the lantern's operation as described by Robinson after the *OMLJ* account in September 1897. Nonetheless, in Robinson's defence there is another factor involved here that is assumed and not explicit. The great triunials, with their three powerful limelights, were used widely in large assembly halls and other public spaces for audiences of 200 persons or more, as lantern work became a major factor in both entertainment and education in the last quarter of the 19th century. In contrast, the exhibition spaces for Beechey's Trinoptric Lantern were quite modest, if not actually small, and were reported to be classrooms, Sunday School rooms, society meeting rooms, or even booths at church fêtes or bazaars. The rise of the triunial lantern coincided with a change in the context of the exhibition of dissolving views which, apart from the Polytechnic Institution itself and a handful of other sites around Europe, changed drastically between the late 1840s and the late 1870s.

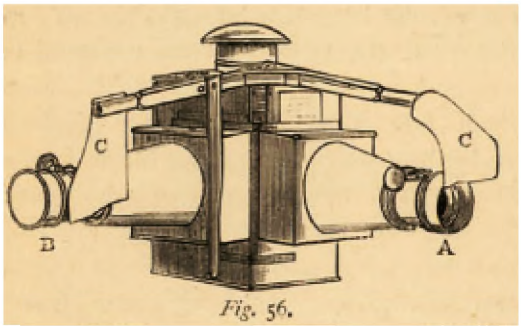
Improvements to its illumination were not the only rapid changes to the Trinoptric Lantern (Fig. 2).[22] The square metal body of the lantern, with an access door at the rear and the other three sides holding slide stages, lens tubes and lenses, each sitting at right angles to the one next to it so that they each pointed at 90 degrees from each other, was quickly changed to a more practical arrangement of the three optical systems separated by only 45 degrees, which still left room for three slide stages to be used. In the original design each of the three lenses had its own V-shaped shutter that could be manipulated gradually from fully open to closed by long levers on the top of the lantern body (labelled as B, C, D in Fig. 1). The length of the levers gave the operator control over a very gradual reduction or increase in the light output of each lens to produce dissolves or other effects. Adjustable reflectors were set in front of the two lenses at opposite sides of the lantern (labelled as A, A in the illustration), later replaced by prisms, which could be set so that their images coincided on screen to produce dissolving views or alternatively to project two or even three adjacent images. This is where things get particularly interesting: were moving slides in either two or even all three of the lens tubes responsible for the 'dioramic effects' given at lectures with the Trinoptrical Lantern?[23]

Momentarily overlooking the vocabulary issues that surround the introduction of any new optical effect, it is clear that the Trinoptric Lantern demanded a subtle and highly skilled operator, no less sophisticated than the practitioners operating triunial lanterns three decades later. There are no references to an assistant or lantern operator in the reports of Beechey's lectures, nor in those of W.D. Hall or W.H. Grattan, which would be consistent with the sometimes very modest schoolrooms or parish rooms in which the events commonly took place. So not only did Beechey invent a sophisticated lantern capable of projecting the most recent sensation of dissolving views and other effects, but he also had the expert skills with which to manipulate it, and the showmanship to elaborate its effects beyond those available to his contemporaries using side-by-side lanterns with sawtoothed (or



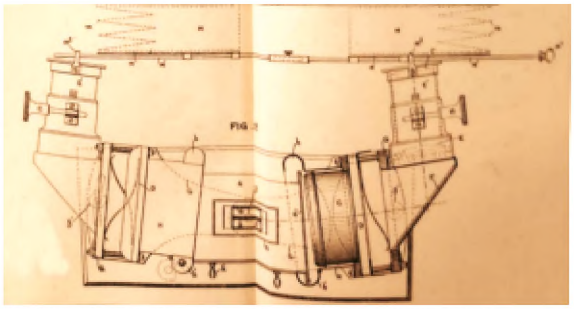

*3. A single-lamp dissolving lantern offered before 1872, with two lens systems served by reflecting mirrors and its lever-operated dissolving shutter by Jules Duboscq, from Abbé Moigno,* l'Art des Projections



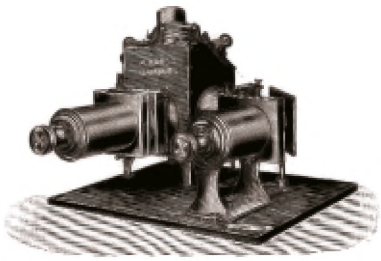



*4. (left) A single-lamp dissolving lantern with adjustable prisms attached to each of its two lens tubes, from Abbé Moigno,* L'Art des Projections

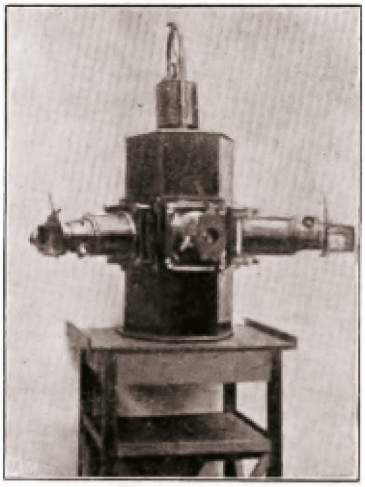
*5. (above) The Keevil Patent Newtonian Lantern with dissolving shutter attached. At the corner of the body just below the two lens systems can be seen the light-tight slot that simultaneously moved the focus of the limelight from one lens to the other while a dissolve was in progress with the shutters. From William Chadwick,* The Magic Lantern Manual, *p.76*



*6. Henry Bond's UK patent 19,926 of 1889 presented a single-lamp dissolving view lantern that was sold by Archer & Sons in Liverpool. The patent drawing here also shows his saw-toothed shutter on its push rod at the top of the image.*



*7. A later single-lamp dissolving lantern from A. Krüß in Hamburg using a mirror to direct light from the single lamp to the second optical system, from Dr R. Neuhauss,* Lehrbuch der Projektion, *1908, p.87*



*8. The last known model of the Trinoptric Lantern, now with a half-hexagonal front and equipped with an arc lamp, from the* OMLJ, *1897*

other) dissolving shutters. Up to date in all respects, and frequently exhibiting chromatropes as an addition to his illustrations, Beechey seems to have been an entertaining and motivating speaker, who was "repeatedly cheered" while delivering a lecture in Burnley[24] and "warmly applauded by a large and highly respectable audience" in Manchester.[25]

Beechey came from a distinguished family of painters. His father, Sir William Beechey RA, had been knighted by George III and his mother, Anne Phyllis Jessop Beechey, had a career as a successful miniature painter. One older brother, Frederick William Beechey, sailed on a polar expedition with W.E. Parry in 1819, was president of the Royal Geographical Society, and retired a Rear Admiral; a younger brother, Richard Brydges Beechey, exhibited at the Royal Academy between 1817 and 1834, travelled in Egypt and India, and was appointed court painter to the Nawab of Awadh (Muhammad Ali Shah) in Lucknow where he retired, still painting. Most of St Vincent Beechey's lectures were on Egypt, the Holy Land, and their Biblical connections, or on the history of astronomy as connected to sacred literature – topics with a strong resonance in his day. But Beechey was not at all straight-laced, and while his lectures were scholarly to the standards of the day, they sometimes ended with views "of an extremely comical nature, which afforded considerable mirth,"[26] and he regularly used the startling discovery of the decade, the chromatrope. Educated at Gonville & Caius College in Cambridge, Beechey was curate in Aylesford, Kent, and Hilgay, Norfolk, and incumbent in Fleetwood and then Worsley, ultimately becoming an honorary Canon at Manchester and returning to Hilgay in his retirement, where the *OMLJ* found him in 1897, reputed to be the oldest living Church of England clergyman.

But after all of this, what to make of his lantern? If it was such a useful single-operator lantern, why did it not become a more popular model? Surely not because it cost the astounding sum of £50, as reported above by a very late user of what might have been the last surving example. Yet even if the cost was only £17 as reported in the *OMLJ* in August 1897, that was still a stiff price when an improved J.H. Steward single lantern cost from £3 10s, and a matched pair for dissolving views was priced at £8 8s.[27] The widely-used Trinoptric Lantern did have an influence in its day, with William Chadwick devoting a separate chapter to the Beechey lantern in *The Magic Lantern Manual* of 1878, saying it "proved very successful for small-sized discs," and commenting further that "the whole arrangement was so simple and unique that we cannot but express surprise that the principle has so long remained in status quo."[28]

Beechey's lantern was only one of several new lantern designs driven by the invention and the popularity of dissolving views. The Abbé Moigno illustrated a lantern by Louis Jules Duboscq (Fig. 3) in 1872[29] that used two sets of lenses and a single light with a lever-operated shutter for dissolving that opened one set of blades while simultaneously closing the other. Moigno also illustrated a 'recent' single lamp lantern with an octagonal body (Fig. 4) that balanced its projected images by fitting an adjustable prism to the front of both of its two lenses; the two projected images, says Moigno, "can be made to coincide perfectly, or they can appear at any distance from each other in all directions. We can understand, without it being necessary to go into further details, the astonishing variety of effects that can be obtained with an apparatus so constructed."[30]

Perhaps the best-known single-lamp dissolving lantern appeared in 1877, the Keevil Patent Newtonian Lantern (Fig. 5). According to Chadwick it was "based upon the original idea of Canon Beechey (namely, dissolving with one light),"[31] and was equipped with a dissolving shutter that operated on each of its two lens systems while simultaneously rotating the oxy-hydrogen limelight inside the lantern body. As a prism directed the light from just one of its two lens systems toward the screen, "to compensate for any loss of light occasioned by the use of the prism, the condenser of this system is made somewhat shorter in focus than the other one, evenness of illumination being thereby secured."[32] Henry Bond patented a single-lamp dissolving view lantern as late as 1889 that was manufactured and sold by Archer & Sons of Liverpool (Fig. 6).[33] Using a saw-toothed shutter operated by a push rod (at M) all of the controls of this lantern were available to an operator behind the lantern and facing the screen, including adjustments to the wick (at K) and manipulation of the slides in two separate stages (at D). An even later single-lamp dissolving lantern was produced by A. Krüß in Hamburg, the separate second lens system furnished with light by a reflective mirror set in front of a larger condenser in the lantern body (Fig. 7).

All of these single-lamp dissolving view lanterns were intended for use in smaller rooms with a maximum projected disc of no more than about 20 ft. The single lamp was intended to keep the cost of the lantern affordable and below the expense of a biunial or two side-by-side lanterns. Clearly significant thought and ingenuity went into the lanterns that followed Beechey's original design, but a number of factors may have inhibited the spread of his original Trinoptric Lantern. There were very possibly issues of showmanship in operating a complex and sophisticated apparatus, issues that were slowly overcome in future decades by the very best lanternists of the late 1870s with their giant triunials. Although Beechey's lantern was modestly a more expensive instrument, it still did not have the advantage of bringing splendour into the venues of its shows. That Beechey was principally lecturing in the Midlands, and his buyers like Hall and Gratton were equally regional practitioners, when combined with Beechey's later statement in 1897 that he "never could get a 20 ft picture, nor in fact any bright one over 10 ft"[33] indicates that for all its flexibility the Trinoptric Lantern was not a lantern aimed at large venues or for big city use (Fig. 8). It could not find a place on the international lantern stage. Nonetheless, the innovative Trinoptric Lantern should not be forgotten, and Beechey should be noted as an ingenious lanternist and inventor, a sophisticated exhibitor

with his lantern, perhaps the rarest of all 19th-century projection devices. Our Society is full of lantern collectors: can someone please find one?

**NOTES AND REFERENCES**

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2. *OMLJ*, January 1897, Vol. 8, No. 2, p.20
3. *OMLJ*, August 1897, Vol. 8, No. 99, p.127
4. *OMLJ*, September 1897, Vol. 8, No. 100, pp.143-44
5. *OMLJ*, October 1897, Vol. 8, No. 101, pp.163-64
6. David Robinson, Stephen Herbert and Richard Crangle (eds), *Encyclopaedia of the Magic Lantern*, The Magic Lantern Society, London, 2001, pp.32-33
7. David Robinson, *Chaplin: His Life and Art*, Collins, London, 1985. Based on his extensive research, Robinson updated this biography twice, and wrote several further books on various aspects of Chaplin's career.
8. David Robinson, 'The first biunial', *The New Magic Lantern Journal* (*NMLJ*), October 1996, Vol. 8, No. 1
9. David Robinson, 'The Rise and Fall of the Triple Lantern', in Dennis Crompton, Richard Franklin and Stephen Herbert (eds), *Servants of Light: The Book of the Lantern*, The Magic Lantern Society, London, 1997
10. *Servants of Light*, pp. 34-45
11. *Liverpool Mercury*, 4 April 1851, Issue 2281, p.2
12. *Designs Office Reports*, 1839-55, Registration of Copyrights of Designs, p.551
13. *Westmorland Gazette*, 8 July 1848, Issue 1489, p.2
14. *Manchester Courier and Lancashire General Advertiser*, 4 November 1848, Issue 1398, p.7, reporting on a lecture by Beechey at the parish church school in Rochdale.
15. *Westmorland Gazette*, 21 April 1849, Issue 1531, p.3
16. *Preston Chronicle*, 1 September 1849, Issue 1931, p.4
17. Cited in: *Blackburn Standard*, 26 February 1851, Issue 841, p.3; *Manchester Times*, 15 December 1852, Issue 430, p.5; *Stamford Mercury*, 18 February 1853, Issue 8235, p.3; *Manchester Courier and Lancashire General Advertiser*, 10 November 1855, Issue 1799, p.7
18. For example, *Hereford Journal*, 18 December 1850, Issue 5799, p.2 and *Sussex Advertiser*, 10 April 1855, Issue 8086, p.6
19. William J. Chadwick, *The Magic Lantern Manual*, Frederick Warne & Co., London, 1878, p.75
20. Chadwick, p.75
21. *OMLJ*, August 1897, Vol. 8, No. 99, p.127. The detailed description in this late report, combined with the simultaneous appearance of an illustration of the Trinoptric Lantern, suggests that the *OMLJ* found access to the lantern's design registration or its copyright. These items may still exist at the National Archives.
22. The article by Hermann Hecht, 'Some English Magic Lantern Patents' in *NMLJ*, January 1982, Vol. 2, No. 2 p. 5, Fig. 21, incorrectly identifies this lantern illustration as Keevil's Patent Newtonian Lantern. The next illustration in the same article, Fig. 22, is also incorrectly identified as the Beechey lantern when it is, in fact, the Keevil lantern. The descriptions of both lanterns in the text are also inaccurate.
23. For example, the 'dioramic effects' exhibited by Beechey after a lecture in Chorley (*Preston Chronicle*, 9 June 1849, Issue 1919, p.5), or two lectures by W.D. Hall at the Royal Sussex Hotel that were "illustrated by a grand moving diorama, produced by the patent trinoptric apparatus," (*Sussex Advertiser*, 10 April 10, 1855, Issue 8086, p.6).
24. *Blackburn Standard*, 26 February 1851, Issue 841, p.3
25. *Manchester Courier and Lancashire General Advertiser*, 10 November 1855, Issue 1799, p.7
26. *Preston Chronicle*, 9 June 1849, Issue 1919, p.5
27. Prices in 1878 from W.J. Chadwick, *The Magic Lantern Manual*, advertisement in the front endpapers. In the same volume, the latest sciopticon lantern was priced at £6 6s. with four-inch condensers, and a Hughes Triplexicon lantern with four-inch condensers cost £4 4s.
28. Chadwick, p.75
29. Abbé Moigno, *l'Art des Projections*, Les Mondes, Paris, 1872, p.67
30. Abbé Moigno, pp.72-73
31. Chadwick, p.76
32. Chadwick, p.77
33. *OMLJ*, October 1897, Vol. 8, No. 101, p.163